

**Remarks/Arguments**

This is a complete response to the Office Action mailed on May 25<sup>th</sup>, 2006 (Office Action) in which claims 1, 3, and 11 were rejected and claims 2, 4-10 and 12 were found to be allowable if rewritten in independent form including all the limitations of the base claim and any intervening claims. Reconsideration of the subject application and further examination is respectfully requested.

**35 USC § 103 Rejection**

**Claim 1**

Claims 1 stands rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 6690850 (Greywall) in view of U.S. patent 6678056 B2 (Downs). Applicants respectfully traverse the rejection on the basis that it has failed to establish a *prima facie* case of obviousness for the following reasons: (I) there is no suggestion or motivation in the prior art to combine Greywall and Downs; (II) a person of ordinary skill in the art would not have had a reasonable expectation of success in combining Greywall and Downs; and (III) each and every claimed limitation is not found or suggested in the prior art of record.

**I. No Suggestion/Motivation to Combine.**

*Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. MPEP 2143.01(I)*

*The proposed modification cannot render the prior art unsatisfactory for its intended purpose. MPEP 2143.01(V)*

The Examiner maintains that, "it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the device of Greywall with

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the reflector of Downs for the purpose of producing a pair of interferogram beams in phase quadrature [citation omitted].” (Office Action pg. 3) No one of ordinary skill in the art would be motivated to combine the corner cube reflector of Downs with the Greywall device because such a combination would render Greywall’s spectral equalizer unsatisfactory for its intended purpose.

The combination suggested by the Office Action renders Greywall unsatisfactory for its intended purpose because Greywall teaches a movable reflective element that may be rotated about an axis of rotation such that the direction of a reflected outgoing optical signal is *nonparallel* to the direction of the incoming signal. (Greywall col 5, lines 12-20) Greywall utilizes this principle to attenuate the strength of a spectral component of a multiplexed signal. (Greywall col 5, lines 34-38) On the other hand, corner cube reflectors reflect incident light back in the direction of the source (i.e. incoming and outgoing signals are *parallel*). (page 1, lines 10-12) Thus, combining Downs’ corner cube reflector with the movable reflective element of Greywall, as suggested by the Examiner, would cause Greywall’s signal 114-1 to be reflected back in an optical path parallel to incoming signal 114-1’s original path (i.e. back into the optical fiber without any attenuation), thereby defeating the purpose of Greywal: that the returning signal 114-1 be received “off-axis.” (See Greywall Fig. 1 & col. 5, lines 20-29) Even if the corner cube reflector were moveable, incident signals impinging on it would be reflected back in the direction from which they came due to the nature of corner cube reflectors. Accordingly, the combination of the corner cube reflector of Downs with the Greywall’s device renders Greywall unsatisfactory for its intended purpose.

Therefore, Applicants assert that the Office Action has not provided valid motivation to combine the cited references and therefore, has not established a *prima facie* case of obviousness.

## II. No Reasonable Expectation of Success.

*The prior art can be modified or combined to reject claims as prima facie obvious as long as there is a reasonable expectation of success.* MPEP 2143.02 (emphasis added)

The Examiner maintains that, “it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the device of Greywall with the reflector of Downs for the purpose of producing a pair of interferogram beams in phase quadrature [citation omitted].” (Office Action pg. 3) This is incorrect. No one with ordinary skill in the art would expect the combination of the corner cube reflector of Downs with the spectral equalizer of Greywall to accomplish such a purpose.

The purpose cited in the office action, that of producing a pair of interferogram beams in phase quadrature, could not be reasonably expected to succeed because the combination of the corner cube reflector of Downs and the Greywall device alone is not capable of producing a pair of interferogram beams in phase quadrature. In Downs, the production of a pair of interferogram beams in phase quadrature (phase difference of  $\pi/2$  radians) is accomplished by applying a phase-shifting coating to a beam splitter. (Downs col. 4, lines 23-33) The corner cube reflector of Downs merely serves to reflect—not produce a phase shift between interferogram beams. Therefore, one of ordinary skill in the art could have no reasonable expectation of success of the combination of the corner cube reflector of Downs and the Greywall device.

### III. Every Limitation Not Disclosed.

*To establish prima facie obviousness of a claimed invention, **all the claim limitations must be taught or suggested by the prior art.*** MPEP 2142.03  
(emphasis added)

Regarding the biasing source of claim 1, the Office Action cites Greywall’s elements 532A and 532B as being a biasing source. However, elements 532A and 532B are described in Greywall as mere electrodes—not as a biasing source for providing a modulated voltage to the base reflector. (Greywall col. 8, line 15; see also Fig. 13) Further evidence that elements 532A and 532B are not a biasing source is found in Greywall’s Fig. 13 and Greywall’s specification. Apparently, elements 532A and 532B

are merely a combination of Greywall's contact pads 1382 and electrically conductive traces 1384. (See Greywall col. 11, lines 14-17)

Claim 3

Claim 3 stands rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 6690850 (Greywall) in view of U.S. patent 6678056 B2 (Downs) as applied to claim 1, and further in view of U.S. patent 4916324 (Meier). However, because the rejection of claim 1 has been traversed and claim 1 is in condition for allowance, any rejections against dependant claim 3 are now moot. Even assuming for the sake of argument that the rejection of claim 3 is not moot, the Office Action has not established a *prima facie* case of obviousness for claim 3 because not every element of claim 3 is disclosed or suggested in the cited references; there is no valid motivation to combine the references; and Greywall teaches away from the proposed combination.

The Examiner maintains that column 2, lines 4-11 of Meier disclose "an optical modulator including an electro-optic material, in which applied electrical fields are used to generate and control the electro-optic material included in the reflector." (Office Action page 3) This is incorrect in that there is no evidence that the reflecting foil mentioned in the section of Meier, to which the Examiner cites, includes electro-optic material. (See Meier col. 2, lines 4-11) There is an electro-optic crystal modulator disclosed in Meier. (Meier col. 2, line 5) However, the crystal modulator is not a reflector, but serves to modulate optical signals that pass through it. (See Meier Fig. 1) The electro-optic crystal modulator of Meier is not equivalent to the base reflector with alterable reflection properties as claimed in claim 3. The limitation of claim 3 requiring a base reflector, which comprises at least one layer by which the reflection properties of said base reflector is altered with an applied voltage is not found in the prior art of record.

The Examiner maintains that "it would have been obvious to one having ordinary skill in the art at the time the invention was made to combine the devices of Greywall and Downs with the reflector of Meier for the purpose of receiving intensive radiation components from the targeted area [citation omitted]." (Office Action page 3) It is unclear to the Applicants whether the reflector mentioned above by the Office Action above refers to Meier's crystal modulator or Meier's foil reflector. However, under

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either scenario, further combining the combination of Greywall and Downs with the foil reflector or crystal modulator of Meier would render Greywall unsatisfactory for its intended purpose. A crystal modulator does not reflect incident signals, as explained above, and could not effectively replace the moveable reflector of Greywall. As for the reflective foils, Meier discloses targets—reflective foils being one example—with broad, nondirectional scattering characteristics. (Meier col. 2, lines 28-31) Such a foil reflector with broad, nondirectional scattering characteristics would be an unsatisfactory replacement for the moveable reflector of Greywall because it would be unable to controllably reflect an incoming signal in a desired direction of propagation. Such control is essential for the spectral equalizer of Greywall to effectively attenuate the strength of a spectral component of a multiplexed signal as taught in Greywall. (Greywall col 5, lines 34-38) No one of ordinary skill in the art would be motivated to combine Greywall/Downs with Meier because such a combination would render Greywall unsatisfactory for its intended purpose. Therefore, because no motivation to combine the references has been provided, no *prima facie* case of obviousness has been established.

Furthermore, even assuming for the sake of argument that Meier did disclose a reflector with alterable reflection properties, Greywall *teaches away* from combining any such alterable reflector with Greywall's spectral equalizer because Greywall defines *reflective surface* as "a surface having a fixed or constant reflectivity." (Greywall col. 3, lines 62-63) Any inclusion of a reflector with alterable reflectivity in Greywall's device would have been contrary to the knowledge of those skilled in the art at the time of the invention as indicated by Greywall's express requirement of reflectors with constant reflectivity. Accordingly, no motivation can be found in the prior art of record for combining Meier with the combination of Greywall and Downs. Thus, no *prima facie* case of obviousness has been established regarding claim 3.

### Claim 11

Claim 11 stands rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. patent 6690850 (Greywall) in view of U.S. patent 6678056 B2 (Downs) as applied to claim 1, and further in view of U.S. patent 4916324 (Meier). However, because the rejection of claim 1 has been traversed and claim 1 is in condition for allowance, any

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rejections against claims, which are dependant on claim 1, are now moot. Since claim 11 depends on claim 1 via claim 10, the rejection against it is considered moot and is requested to be withdrawn.

Claim Objection

Claims 2, 4-10, and 12 were objected to as being dependent upon a rejected base claim. Applicants respectfully submit that the rejection of claim 1 has been traversed, and request that the objection to dependent claims 2, 4-10, and 12 be withdrawn.

Conclusion

Applicants respectfully submit that no *prima facie* case of obviousness has been established for claims 1, 3, and 11 and that claims 1-12 are in condition for allowance. No fee is due for this response.

Respectfully Submitted,

A handwritten signature in black ink, appearing to read "J. Eric Anderson", written in a cursive style.

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